

Remarks

Preliminary Matters

Claims 1, 2, 5, 7, and 9 are pending. No Claims have been added. Claims 3, 4, 6, and 8 were cancelled, because the subject matter of Claim 4 was moved to Claim 1 to place the pending Claims in condition for allowance or appeal. No additional fees are required. If determined otherwise, the Office is authorized to charge Deposit Account No. 07-1077 for the amount.

§ 103 Rejections

Applicants have amended Claim 1 to insert the specific type of surface modifier (E) from Claim 4 to overcome the rejection of the pending Claims applying either U.S. Pat. No. 5,843,577 (Ouhadi et al.) or U.S. Pat. No. 5,856,399 (Itoh et al.).

The Office cites Ouhadi et al. as teaching improved surface properties, but the applicable passage of Ouhadi et al. is Col. 5, lines 62 et seq. where Ouhadi et al. explain that it is the presence of a copolymer of functionalized polyolefin and polyamide that improves the surface properties of the compound. Therefore, Ouhadi et al. at Col. 5, lines 45-60 does not reveal any particular surface modifier, **and particularly hydrogenated castor oil**, that "...migrates uniformly onto a surface and forms a wax layer." as required by Applicants' Claim 1.

The Office can not disregard the phrase of Claim 1, ***hydrogenated castor oil, which migrates uniformly onto a surface and forms a wax layer.*** when considering the inventiveness of Applicants' invention over Ouhadi et al. Nothing in Ouhadi et al. remotely suggests that one of a laundry list of conventional additives, present in as much as 65% of the total weight of the compound, will ***migrate uniformly onto a surface and form a wax layer.***

The Office can not disregard the vector of teaching by Ouhadi et al. that explains the purpose of the polyolefin/polyamide copolymer (Col. 5, Line 62 et seq.):

The presence of a copolymer of functionalized polyolefin and polyamide improves the surface properties and particularly the property of ***adhesion to*** engineering resins, glass and metals such as steel, copper, aluminum or titanium.

Thus, such a copolymer can be used as *adhesion promoter* in polyolefinic thermoplastic elastomers. (Emphasis added)

Ouhadi et al want an adhering thermoplastic elastomer; Applicants want a slippery thermoplastic vulcanizate. Nothing in Ouhadi et al. makes Applicants use of hydrogenated castor oil obvious as a surface modifier. Nothing in Ouhadi et al. reports the formation of a wax layer on a surface. If that were to happen, the adhesion promotion would suffer. Ouhadi et al. teach *away* from Applicants.

The Office cites Itoh et al. as teaching improved surface properties but the text (Col. 6, lines 15-48) concerns softening of the rubber components, i.e., a plasticizing effect on the rubber. Therefore, Itoh et al. does not reveal any particular surface modifier that "...migrates uniformly onto a surface and forms a wax layer." as required by Applicants' Claim 1.

The Office states that the long list of softeners of Itoh et al. block the patentability of Applicants' claimed invention. Applicants have confined their surface modifier to hydrogenated castor oil, even while having a large component of plasticizer also present in the compound. As Applicants show, the mere presence of plasticizer is not enough to provide the low coefficient of friction surface that Applicants want.

Itoh et al. also teach in a vector away from Applicants' invention, beginning at Col. 6, Line 44:

If the softener (D) is used in the above-mentioned amount, the resulting thermoplastic elastomer composition has high fluidity in the molding process and *mechanical properties of its molded product are not lowered.* (Emphasis added)

Itoh et al want a thermoplastic elastomer with the same mechanical properties as would be present without the softener (D); Applicants want a slippery thermoplastic vulcanizate because of the addition of surface modifier (E). Nothing in Itoh et al. makes Applicants use of hydrogenated castor oil obvious as a surface modifier. Nothing in Itoh et al. reports the formation of a wax layer on a

surface. If that were to happen, the mechanical properties would change. Itoh et al. teach *away* from Applicants.

These arguments for patentability more than rebut the prima facie obviousness rejection, because these arguments *use the very words of the references* to show how patentably different Applicants' claimed invention is from the references.

Moreover, Applicants assert that their comparative empirical evidence overcomes the obviousness rejections by the Office. **Please see the Examples beginning at Page 5, line 20 of the specification.**

Applicant provides specific comparative evidence that the use of hydrogenated castor oil, in addition to a conventional, commercial formulation of thermoplastic (A), rubber (B), plasticizer (C), and conventional additives (D) reduces the adhesive friction value and the sliding friction value when tested according to DIN 53375.

This quantitative evidence rebuts any rejection using either Ouhadi et al. or Itoh et al. because the use of hydrogenated castor oil (the ONLY difference between the two formulations) *changed the resulting surface properties of the experimental samples*.

- Ouhadi et al. do not want a slippery surface if their modifier copolymer is to provide "adhesion promotion".
- Itoh et al. do not want any change to "mechanical properties" because of the use of a softener.

Nothing of Ouhadi et al. or Itoh et al. suggests to one of ordinary skill in the art to add a surface modifier containing hydrogenated castor oil so that it "...migrates uniformly onto a surface and forms a wax layer." as required by Applicants' Claim 1. Therefore, Claims 1, 2, 5, 7, and 9 are patentable over both references.

Reviewing both Table 1 and Table 2 on page 6 is important for patentability. Both adhesive friction value and sliding friction value were 3 to 4 times better with surface modifier (E) present. This solves the problem articulated by Applicants at the beginning of their application: to provide a layer that has a low coefficient of friction

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to enable easy assembly of seals, plugs, and nozzles. Therefore, the quantitative results of Tables 1 and 2 are relevant and persuasive to rebut any obviousness rejection using either Ouhadi et al. or Itoh et al.

Conclusion

Applicants request a Notice of Allowance for Claims 1, 2, 5, 7, and 9.

If there are any matters that prevent a Notice of Allowance, the Examiner is invited to contact the undersigned by telephone.

Respectfully submitted by:

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Date

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